

Remarks/Arguments

Claims 1-11 are pending in the application, with claims 8 and 9 withdrawn from consideration. With this amendment, claims 1 and 11 have been amended.

Support for the amendments to claims 1 and 11 can be found in the originally filed application, for example, at page 3, lines 11-15. No new matter has been added.

Claims 1-7 stand rejected under 35 U.S.C. § 112, first paragraph. Specifically, the Office asserts that the inorganic binder in an amount from 0.0025% to less than 0.1% and the organic binder in an amount greater than 0.5% to 3% recited in claim 1 is unsupported by the specification. Claim 1 has been amended to address the rejection, the support for which is found, for example, at page 10, lines 18-23. In view of the amendment, Applicants submit that the rejection has been overcome.

Claims 1-7 and 11 stand rejected under 35 U.S.C. § 103(a) as unpatentable over U.S. Patent No. 4,919,711 ("Banyai"). Claim 10 stands rejected under 35 U.S.C. § 103(a) as unpatentable over Banyai and further in view of JP 02250929 A ("JP '929"). Claim 11 stands rejected under 35 U.S.C. § 103(a) as unpatentable over U.S. Patent No. 5,698,007 ("Schmitt") in view of U.S. Patent No. 3,205,063 ("Franklin").

In response to the rejections Applicants provide the following distinguishing comments, which are believed to place the present case in condition for allowance. Favorable reconsideration of all of the pending claims is respectfully requested.

I. The Rejection of Claims 1-7, and 11 Under 35 U.S.C. § 103(a) Over Banyai et al.

The Office rejects independent claims 1 and 11 as obvious over Banyai. Referring to the Office Action mailed September 17, 2007, to which the Office cites in the current Action, the Office states that Banyai "discloses that the agglomerated green pellets are dried and fired by slowly heating to preferably at least 2400°F. (i.e. 1315°C) where drying is performed at low temperature then firing at high temperature (col. 5, lines 34-48)" (Office Action dated September 17, 2008, page 7). The Office

concludes that such disclosure is equivalent to heating in stages, as recited in Applicants' independent claims 1 and 11.

Claims 1 and 11 have been amended to include the feature of "heating said green pellets in stages, ***said stages comprising a preheat stage having a temperature in the range of 900°C to 1200°C*** and a final stage having a temperature in the range of about 1,275-1,350°C." (emphasis added). Applicants submit that the recited heating step cannot be considered equivalent to the alleged heating in stages the Office asserts is disclosed in Banyai.

More specifically, Banyai's alleged stages for heating its agglomerated green pellets include a stage in which its pellets are dried at low temperature and a stage of firing at high temperature of at least 2400°F. Banyai does not state what this "low temperature" of its drying stage is, although Example 1 indicates that "[d]ried balls were obtained by placing green balls in a 105°C oven for 18 hours." (Banyai, col. 6, lines 66-67). This temperature is well below the claimed preheat stage having a temperature of 900°C to 1200°C as recited in Applicants' claims 1 and 11.

Moreover, at page 3 of Applicants' specification, the preheat stage is described as an additional stage following drying in the furnace in which the pellets are transported to the preheat zone. In the drying stage, "[t]he moisture in the pellets is removed by induration at temperatures normally between 400-600°C." (Specification, page 3, lines 7-9). On the other hand, the preheat stage, which occurs after the drying stage, increases the pellets' hardness before they are transported to the kiln and/or final firing stage. Heating in this preheat stage generally occurs at 900°C to 1200°C. (Specification, page 3, lines 11-15). Thus, the preheat stage is distinguishable from, and in addition to, the drying stage.

Accordingly, Applicants' heating stages of claims 1 and 11, which comprise a preheat stage having a temperature in the range of 900°C to 1200°C and a final stage having a temperature in the range of about 1,275-1,350°C, are not equivalent to Banyai's alleged "heating stages" which include a low temperature drying stage (i.e. at or near 105°C) and a stage of firing at high temperature of at least 2400°F.

Consequently, Applicants submit that at least for the reason that the heating stages as recited in claims 1 and 11 are neither disclosed nor suggested in Banyai, a *prima facie* case of obviousness has not been made and the rejection must be withdrawn.

Furthermore, Banyai discloses a binder for agglomerating a concentrated ore in the presence of water comprising

1. a water-soluble polymer such as CMC, and
2. sodium tripolyphosphate.

The Office maintains that even though Banyai discloses sodium tetraborate as a non-preferred and inferior embodiment, Banyai nevertheless renders Applicants' claimed invention obvious. Applicants submit that at col. 7, lines 4-5, Banyai discloses that mine operators generally require that green balls be able to withstand at least 6 drops. In addition, according to Banyai, although dry compressive strength of 10 or more pounds is desired, in practice, it has been difficult to attain dry strengths greater than 5 lbs. with non-bentonite binders at economically acceptable use levels. (Col. 7, lines 5-9). Banyai's alleged invention, which includes carboxymethyl cellulose (CMC 7HX) and sodium tripolyphosphate, however, has, for example, a wet drop of 10.4 and a dry compressive strength of 4.2 lbs, as set forth in Table 2, Sample 2-1.

The disclosure of Banyai to which the Office cites for maintaining its rejection is that of Example 3-12 listed in Table 3, which includes a list of 16 comparative samples. This appears to be the only mention of a sample including sodium tetraborate. Example 3-12 identifies a wet drop number 6.6 and a dry compressive strength of 1.4 lbs.

Applicants submit that when Banyai is read as a whole, i.e. in its entirety, the focus of Banyai is clearly devoted to Banyai's alleged invention of binder compositions including alkali metal salts of carboxymethyl cellulose and sodium tripolyphosphate. According to Banyai, this combination greatly enhances performance. (See Banyai, col. 2, lines 32-40). In contrast, when compared to Banyai's alleged invention, the comparative samples including Example 3-12, are presented by Banyai to show that their performance is **clearly inferior** to that of Banyai's binder.

Applicants submit that based on Banyai's clear attempt to show the enhanced performance of its binder compared to 3-12, coupled with Banyai's inclusion of merely one sample of sodium tetraborate as one of several "inferior" comparative examples, one of ordinary skill in the art could only construe Banyai as **teaching against** the use of sodium tetraborate as a binder additive. For at least this additional reason, Applicants respectfully submit that the Banyai cannot be reasonably construed as rendering the claimed invention obvious; reconsideration and withdrawal thereof is respectfully solicited.

II. The Rejection of Claim 10 Under 35 U.S.C. § 103(a) Over Banyai et al., and further in view of JP '929

Claim 10 stands rejected as obvious over Banyai et al., and further in view of JP '929. For at least the reasons that claim 1 is patentable, Applicants submit that claim 10, which depends from claim 1, is also patentable. Claim 10 may also, however, be separately patentable for additional reasons as well.

III. The Rejection of Claim 11 Under 35 U.S.C. § 103(a) Over Schmitt in view of Franklin

The Office rejects independent claim 11 as obvious over Schmitt in view of Franklin. The Office asserts that Schmitt teaches agglomerating particulate material such as iron ore, and a binder that is a water-soluble polymer and includes alkali metal salts of carboxymethyl cellulose. (Office Action, page 4). The Office also asserts that the agglomerate includes borates, at line 44 of column 3. The Office, however, acknowledges that Schmitt does not specifically teach that the borates of Schmitt include sodium tetraborate or calcium tetraborate.

Turning to Franklin, the Office asserts that Franklin discloses a composition for making carbonate-bonded agglomerates of iron ore including ore fines, an alkaline earth metal compound, water and sodium tetraborate, in certain specified amounts. The Office concludes it would have been obvious that the borates in Schmitt "would include sodium tetraborate, since Franklin et al teaches that a small amount of sodium

tetraborate increases the solubility of CO₂ in the green agglomerates, thus enabling one to obtain satisfactory final agglomerates.” (citations omitted)(Office Action, page 4).

Applicants respectfully submit that the Office's rejection based on the combination of Schmitt and Franklin is flawed. Specifically, the Office's position that the agglomerate of Schmitt can include borates, while true, is also misleading. At column 3, beginning at line 17, Schmitt lists particulate material that may be agglomerated in accordance with its alleged invention, beginning its list with metallic minerals or ore. Among those listed is iron. At column 3, beginning at line 36, Schmitt further lists “[m]inerals other than metallic minerals which may be agglomerated.” Among the list of several of such minerals, borates are included.

Applicants submit, therefore, that while it is true that the agglomerate materials of Schmitt can include borates, the borates are described in Schmitt as being the agglomerated material itself. In other words, Schmitt's borates are described such that they are agglomerated material, for example like the iron-oxide containing pellets as recited in claim 11. Schmitt does not disclose or suggest, however, that the borates can be included as a binder additive. Rather, Schmitt discloses the use of caustic to achieve a binder enhancing effect. Thus, the borates disclosed in Schmitt are described and used in a different context and are nonanalogous to the binder additive borates of claim 11. Nowhere does Schmitt contemplate the use of borates as binder additives in combination with carboxymethyl cellulose or salts thereof.

Moreover, even if the list of particulate material disclosed in Schmitt could somehow be interpreted to be a list of “binder additives,” nothing in Schmitt indicates that borates would work any better than any of the other “binder additives” listed. Thus, at best it might have been obvious for one of ordinary skill in the art to try each material to determine which would work. But one of ordinary skill in the art would not only have to try each material to arrive at borates, but in addition, one of ordinary skill in the art would also be faced with the choice of which borate to select from among the class of borates. Although Franklin identifies one possible option, there is no indication, however, that Franklin's disclosed sodium tetraborate would work in a binder system

that also includes carboxymethyl cellulose. The Office apparently leaps to the conclusion without any evidence in support of its conclusion.

Applicants submit, therefore, that the Office's obviousness rejection is at best based on an improper obvious to try rationale. As set forth in the M.P.E.P. 2145(X)(B):

The admonition that "obvious to try" is not the standard under § 103 has been directed mainly at two kinds of error. In some cases, what would have been "obvious to try" would have been to vary all parameters or try each of numerous possible choices until one possibly arrived at a successful result, where the prior art gave either no indication of which parameters were critical or no direction as to which of many possible choices is likely to be successful.... In others, what was "obvious to try" was to explore a new technology or general approach that seemed to be a promising field of experimentation, where the prior art gave only general guidance as to the particular form of the claimed invention or how to achieve it. M.P.E.P. § 2145(X)(B)(quoting *In re O'Farrell*, 853 F.2d 894, 903, 7 USPQ2d 1673, 1681 (Fed. Cir. 1988) (citations omitted)).

Here, neither Schmitt nor Franklin provides any guidance as to the specific combination of recited in claim 11. Rather, Applicants submit that the mere mention of "borates" from among the substantial list of particulate material that may be agglomerated fails to provide any guidance to one of ordinary skill in the art to choose not only borates from among the lengthy list of possible options, but also the specific borates of claim 11. Further, Franklin fails to provide any guidance that its particular composition could further include carboxymethyl cellulose. It appears that the only guidance to arrive at Applicants' invention is from Applicants' own disclosure. As such, Applicants' submit that the Office has failed to establish a *prima facie* case of obviousness based on the combination of Schmitt and Franklin.

Accordingly, for all of the above reasons, Applicants submit that the Office has not made out a sustainable obviousness rejection of claim 11. The rejection is therefore believed to be improper; reconsideration and withdrawal thereof is respectfully requested.

IV. Conclusion

Therefore, in view of the amendments and remarks herein, the present application is believed to be in condition for allowance, which action is earnestly solicited.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'Ralph J. Mancini', with a large, sweeping initial 'R'.

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